

Declass Review by NIMA / DoD

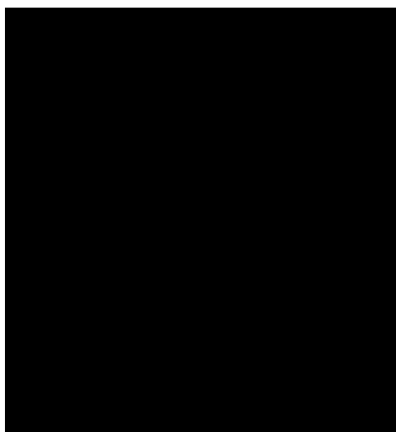
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[REDACTED] 3072/68  
14 November 1968  
Copy 1

MEMORANDUM FOR THE RECORD

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SUBJECT: MSWG Tour of [REDACTED] on  
24 and 25 October 1968

1. Attendance: Those present on the tour were:

- a.  
b.  
c.  
d.  
e.  
f.  
g.  
h.  
i.  
j.  
k.  
l.  
m.



2. Welcome: [REDACTED] welcomed our group to [REDACTED] and presented a brief outline of the [REDACTED] Of interest was the fact that [REDACTED], manufacturers of photo processing equipment, and [REDACTED] manufacturers of eye glasses are a part of the [REDACTED] then introduced [REDACTED]

3. R. S. Material: [REDACTED] gave a briefing on the new R. S. material under development by [REDACTED] This material is a duplicating stock intended to replace Eastman's 2430 duplicating film. [REDACTED] will begin production shortly on this material and it may be on the commercial market as early as 1969.

[REDACTED] is putting a lot of money into this product but is waiting for market acceptance prior to building a domestic production facility.

GROUP 1  
Excluded from automatic  
downgrading and  
declassification

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Talent-Keyhole

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Plans for this facility are on the drawing board and a plant site has already been chosen. The R. S. material claims a higher image reproduction quality with superior retention of information when compared to E.K.'s 2430. This product differs from conventional photographic films in that the R. S. material utilizes Titanium Dioxide rather than silver salts as the photo conductor. The metallic silver which provides the final image density is introduced during processing which results in a 37 percent saving of this metal in the final positive (compared to E.K.'s 2430). The latent image of the R. S. material begins to decompose immediately after exposure and, therefore, processing or stabilization must be accomplished within minutes. A printer/processor to accommodate this product is also under development. A unique feature of the R. S. material is its ability to be resensitized and over printed, thus such things as grid lines, annotations and/or titling can be added. Because processing or stabilization must be accomplished almost immediately after exposure and due to the slow inherent speed of the photo conductor, major emphasis is placed upon the material as a duplicating, rather than taking, film. Research on the taking aspect continues. Promising indications are that the R. S. material could become a non-silver product in the near future.

The tonal range of the present material goes from 0.6 to a 5.0 density and the spectral sensitivity can be controlled by filtration and the use of different photo conductors. The image appearance is similar to that of 2430 except that the clear areas are slightly milky due to the dispersion of the photo conductor, which remains in the material. The R. S. material is manufactured in white light and is sensitized by a period of dark storage prior to exposure. [REDACTED] stated: "Because of the high quality of our originals, we are at the danger point for dupe stock resolution." As is expected after such a statement, a higher resolution retention capability than 2430 is claimed by the R. S. material. Pending contract signature, in about 12 months, [REDACTED] expects to deliver, probably to [REDACTED] an R. S. type printer/processor with a dual gamma capability. The printer portion of the unit will be a standard Niagara printer which will limit the maximum production rate to 100 feet per minute.

[REDACTED] is now working to develop an R. S. printing paper. Other projects include a table top processor to make chips in both paper and film form. [REDACTED] is interested in a film chip product from such a machine.

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[REDACTED] TALENT-KEYHOLE  
CONTROL SYSTEMS JOINTLY

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4. Optics: After an enjoyable lunch in the executive dining room at which [REDACTED] were introduced, [REDACTED] head of the optic's directorate, gave a briefing on lens manufacture at the [REDACTED] facility. The formal briefing was concluded with a tour of the [REDACTED] computer installation employed for optic's design, the lens manufacturing departments and the optic's testing branch. This facility produces the lenses used in the KH-4A, KH-4B, and Optical Bar cameras. 25X1A

Manufacturing techniques employed to produce the KH-4A lenses and those used for KH-4B lens production were compared and the improvements, such as purchasing all lens blanks from the same meld, were discussed. The improved techniques resulted in an increase of approximately 45 1/mm between an average first and second generation lens. Some little known facts which were mentioned are:

- a. An emery slurry is the abrasive used to grind the blank.
- b. An iron oxide slurry is employed to polish the lens.
- c. The air spaces employed between elements must be vented in order to accommodate the pressure variation at different altitudes. Small air filters are installed in these vents to keep the air spaces free of foreign particles.
- d. The KH-4 and Optical Bar lens barrel which are made of a Beryllium/Titanium alloy, are not an [REDACTED] product but are purchased on the open market. 25X1A

Our walk-through-tour began at the computer facility, proceeded to the lens production area, continued to the lens bench test department and terminated at the environmental test area. This last area contains collimator equipped test tanks large enough to accept an entire camera system for adjustment and testing.

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5. Optimum Gamma: [REDACTED] gave a briefing on what he termed "optimum gamma processing". Conventional three level Trenton processing produces gammas of 2 to 3 on 3404 while [REDACTED] contends that the "optimum" gamma on 3404 for our use is 1.4. This lower gamma is said to produce:

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 24 and 25 [REDACTED] on

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a. Better edge definition. (as achieved on some edge trace tests).

b. Higher Resolution. [REDACTED] claims over 700 l/mm on 3404 with low gamma).

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c. Lens graininess: The ideal chemistry for each film is one that produces a 1.4 gamma with no loss in film speed. [REDACTED] happens to sell an optimum gamma chemistry for 3404.

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6. Automatic Stereo Scanner: On the morning of 25 October Mr. [REDACTED] briefed us on the Automatic Stereo Scanner under development by [REDACTED]. The Automatic Stereo Scanner project was begun in 1965 as an off-shoot of the ARES I, II, and III; [REDACTED] Eye Projects. Actual work on the Automatic Stereo Scanner was started in 1965 with delivery of the first unit planned for March 1969. The purpose of the Automatic Stereo Scanner is to provide a means for the rapid scanning of high resolution photography from present and future reconnaissance systems. It will handle the KH-4, [REDACTED] material and future systems whose separation of stereo pairs are within a range of from 27/8 inches to 35 feet on a single film web. The unit will also accommodate conjugate imagery from systems employing separate film webs. Zoom optics with a maximum magnification of 30X and a 200 l/mm capability, automatic positioning of stereo imagery, ability to accommodate for scale differences up to 9:1, anamorphic correction for photographic distortion up to 4:1 and a field rotation up to 360 degrees is provided by the unit. The viewer itself is seven feet across, stands six feet high and weighs 2,000 pounds; a separate on-line computer and teletype console take additional space. The instrument will provide normal stereo, reverse stereo, binocular left, and binocular right viewing/scanning. A 4X5 polaroid camera is also incorporated as a means of providing a record in the form of a stereogram of what the operator sees. The Automatic Stereo Scanner is a most impressive piece of equipment whose engineering and design seem extremely well accomplished especially from the psychophysical standpoint. An example of the thought given to its design is the feature of the special chair which accompanies the unit. Because of the size, structure and alignment characteristics of the Automatic Stereo Scanner, its construction would not permit adjustment for the accommodation of various operator heights. As a solution to this problem, a special variable height chair was designed to permit operator adjustment to the height required for proper utilization of the scanner.

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7. Systems: Mr. [REDACTED] presented a briefing in which he compared the KH-4B to the KH-4A. Both design and performance differences were discussed in his extremely comprehensive briefing. Following lunch we toured the final check-out facilities for the KH-4 and Optical Bar cameras. Actual systems undergoing test were operated so that their movement could be observed.

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8. Time: The tour of the [REDACTED] facilities was extremely well-planned for maximum time usage. Our itinerary was so tight that in order to conserve time, Friday's lunch was served in a room adjoining that in which we received the pre-lunch briefing.

9. Impressions:

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a. Mr. [REDACTED] stated that it is unfortunate Mr. [REDACTED] is not spending more time with the KH-4B system rather than concentrating his efforts on [REDACTED] I gather from this that [REDACTED] is receiving less help from [REDACTED] than they were expecting.

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b. The [REDACTED] approach is now aimed toward the reproduction quality aspect of our procedure. The big push is already on to sell us the R. S. material.

c. In some respects the non-technical personnel which comprise the majority of the MSWG receive a slanted view of the briefing presentations such as on "Optimum Gamma" and the R. S. material. That we are presently having our mission material processed 'dual gamma' was news to most of our group, several of which [REDACTED] became upset that this change had not been approved by all building components. They were likewise upset that no studies have been accomplished prior to this change in procedure. From the TSSG standpoint, this looks bad in [REDACTED] eyes even though such changes have building coordination and approval. The old addage - "a little knowledge is a dangerous thing" - holds true in situations like this.

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[REDACTED]  
NPIC/TSSG/APSD/IEB/Sec.I

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Distribution:

Cy 1 - NPIC/TSSG/APSD project fldr.

2 - NPIC/TSSG/APSD chrono

NPIC/TSSG/APSD/[REDACTED] lms/3305 (18 Nov 68)

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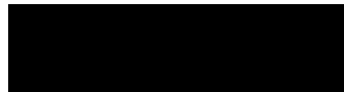
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